

Doog

NAVIGATION MODE
COMPARISON





Follow-Me Navigation

- Target tracking navigation
- Does not require any tracker device on humans to work
- Actively track and follows the target and at the same time avoid obstacles



Memory Trace® Navigation

- Autonomous navigation
- Navigate by frame map matching, based on route memorization (NOT SLAM)
- Easy to setup even for a non-technical person



Line Trace Navigation

- Line tracking navigation
- Uses retro-reflective tape instead of magnetic/color tape on floor
- Can be use in both indoor and outdoor (By using different material with retro-reflective properties)

All three DOOG navigation work under these conditions

- Does not require Wi-Fi connectivity to work
- Does not require Bluetooth device to work
- Does not require laptop/tablet or using complicated software/app to setup
- Does not require technical knowledge (robotics) to plan robot route
- Work in both indoor and outdoor environment

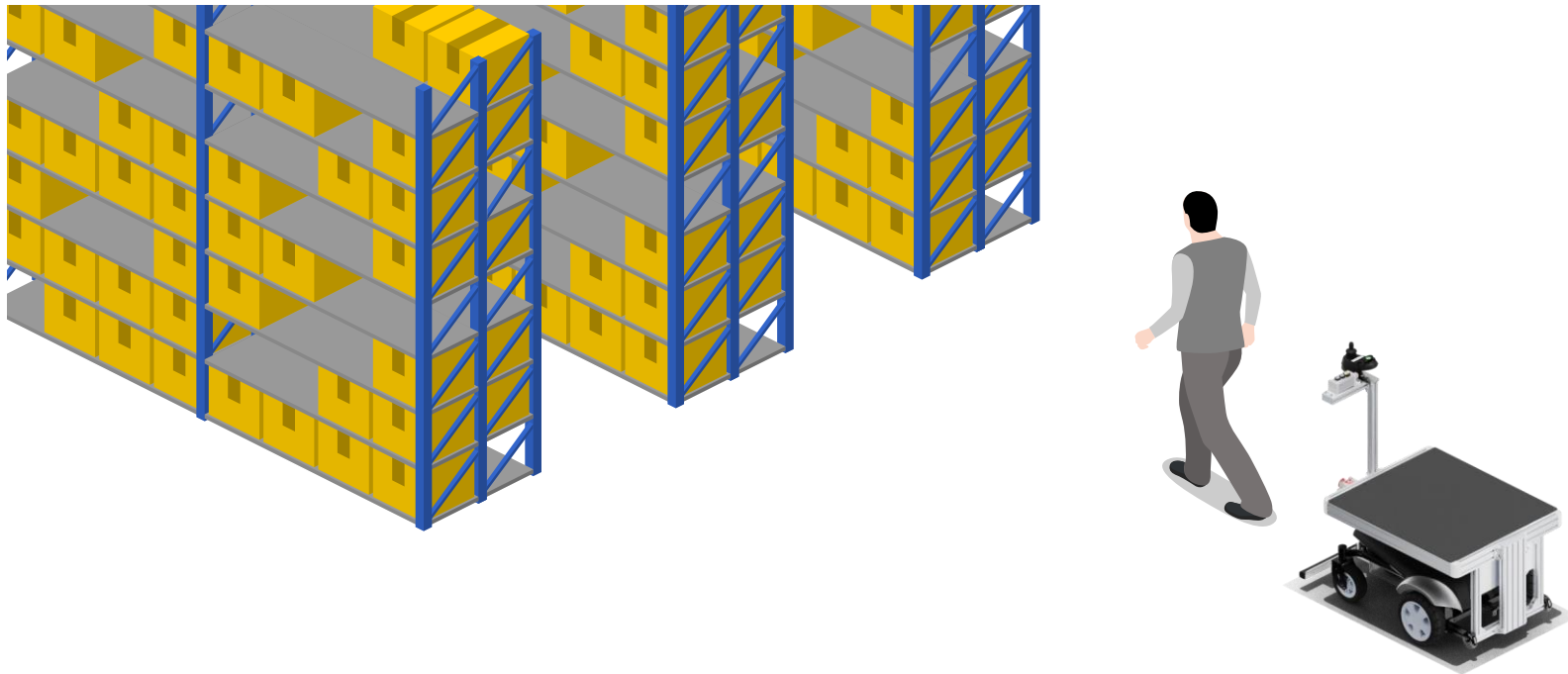
What did every single of our customer appreciate in Thouzer?

Fast implementation that work seamlessly

Follow-Me Navigation

It is suitable for following operating conditions

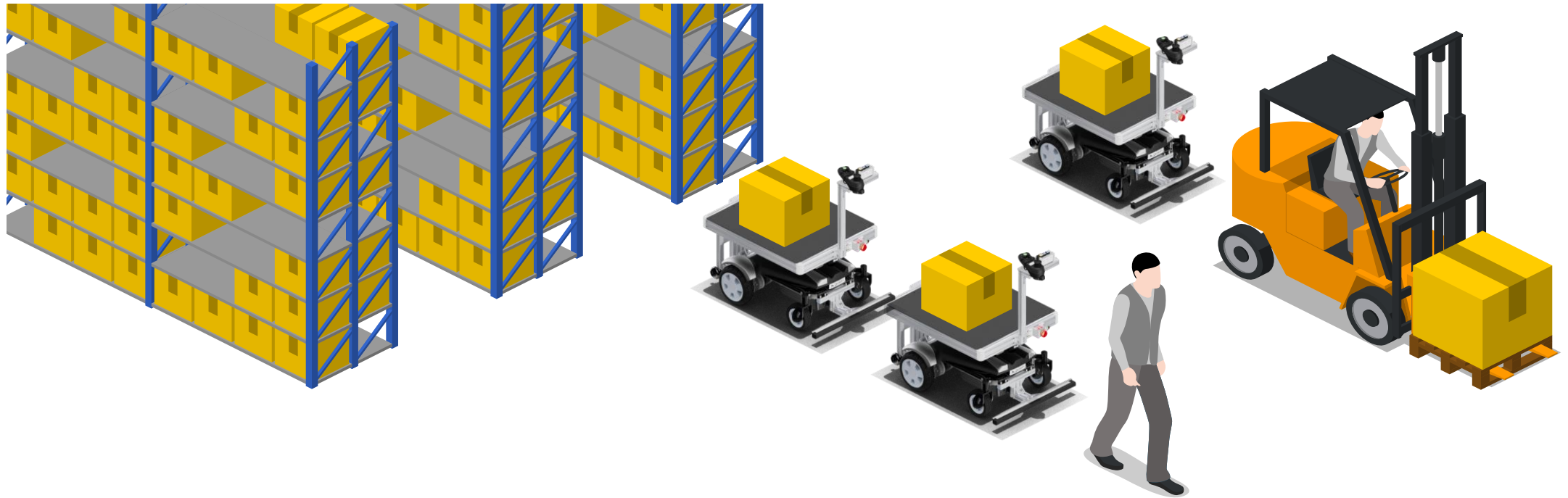
- To improve goods transportation that previously require more than one person to push over a long distance
- For non-routine tasks that require human to do picking/placing
- Require the fastest implementation speed (activation with just a press of button)
- Operating in common/public area which route teaching or tape on floor is not possible



Follow-Me Navigation

It is suitable for following operating conditions

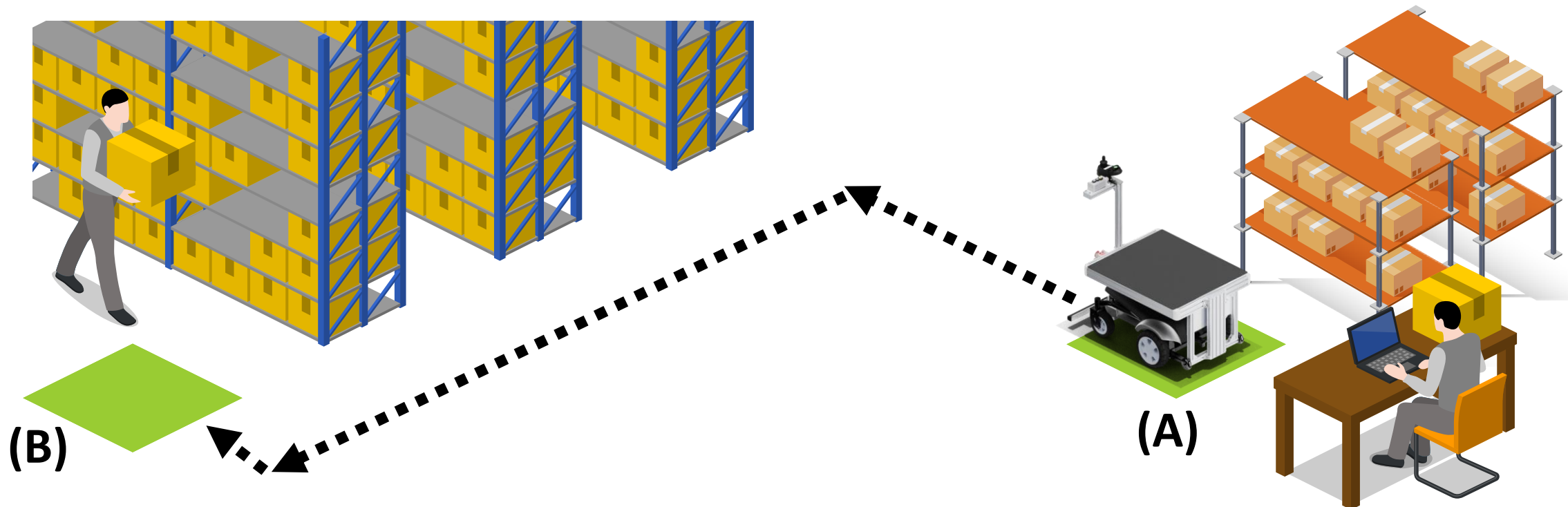
- Require less capital expenditure to improve worker productivity
- Easily scalable according to operation needs by utilizing multiple Thouser
- Adding productivity not just human worker, but also vehicle and other mobile robots



Memory Trace[®] Navigation

It is suitable for following operating conditions

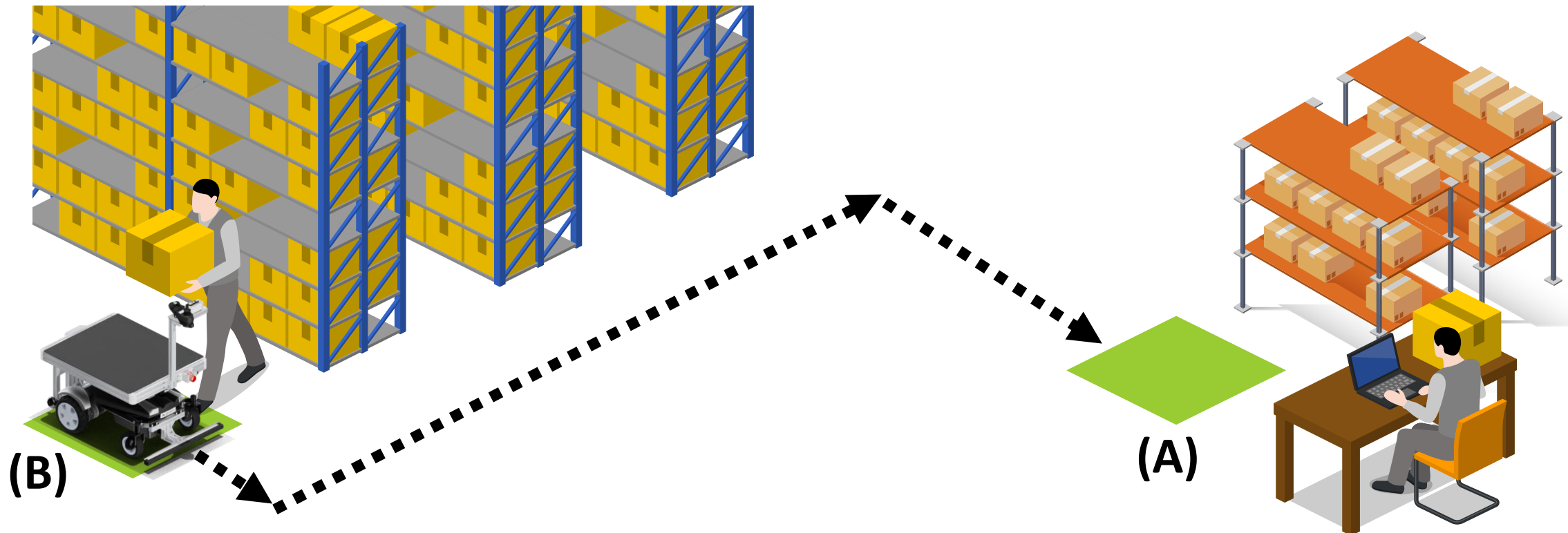
- Does not require any operator to involve in goods transportation
- For fixed routine tasks, where station points are fixed *
- Training on set up and operation for operator is needed *
- Sufficient features (wall, pillars, structure) within the sensor sensing range (30m radius from Thouser), indoor



Memory Trace[®] Navigation

It is suitable for following operating conditions

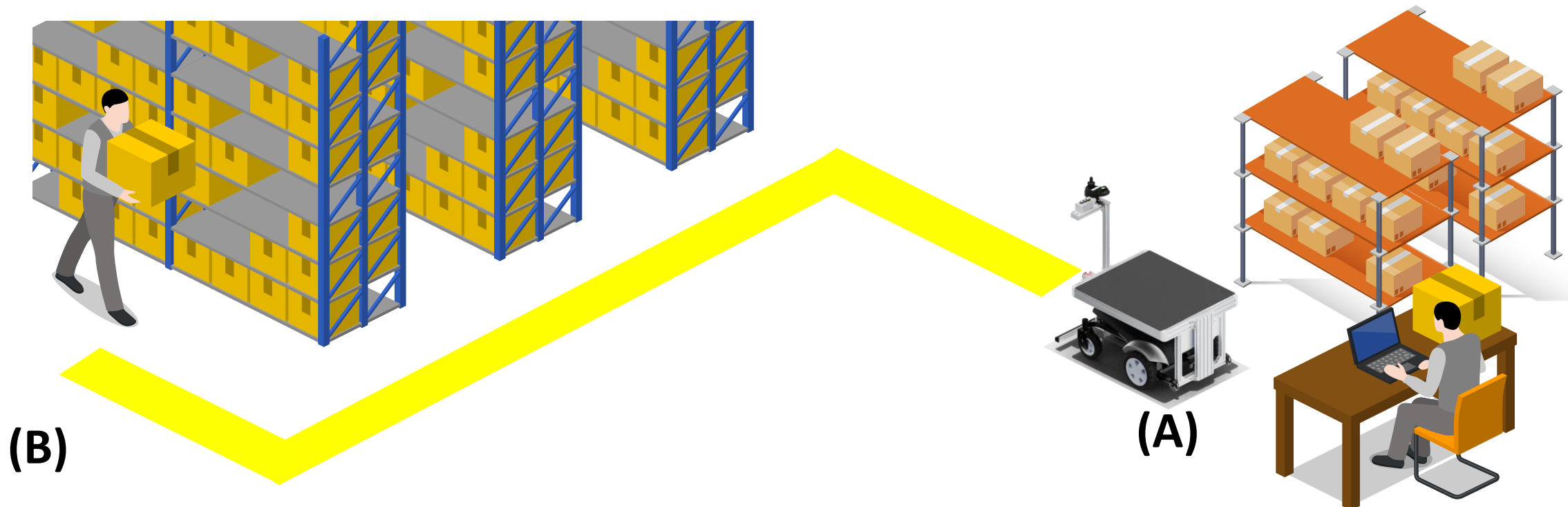
- Long distance transportation where tape maintenance will be expensive
- Tape on floor is not allowed due to MHE operation, or any other reason
- Operating environment does not affect Thouzer positioning in an unacceptable degree for customer



Line Trace Navigation

It is suitable for following operating conditions

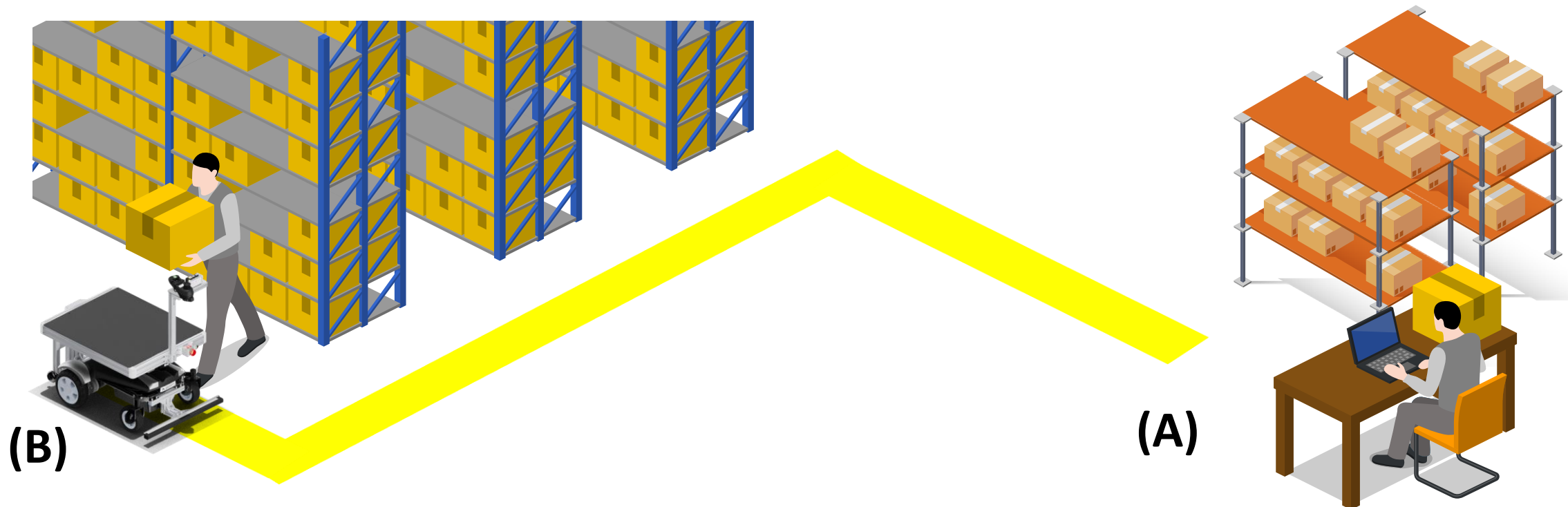
- Does not require any operator to involve in goods transportation
- For more flexible routine tasks (fixed stations is not required as Thouzer can navigate if there is line present)
- Customer prefer tape on floor to show the robot route
- Easier to set up and operate compared to Memory Trace®



Line Trace Navigation

It is suitable for following operating conditions

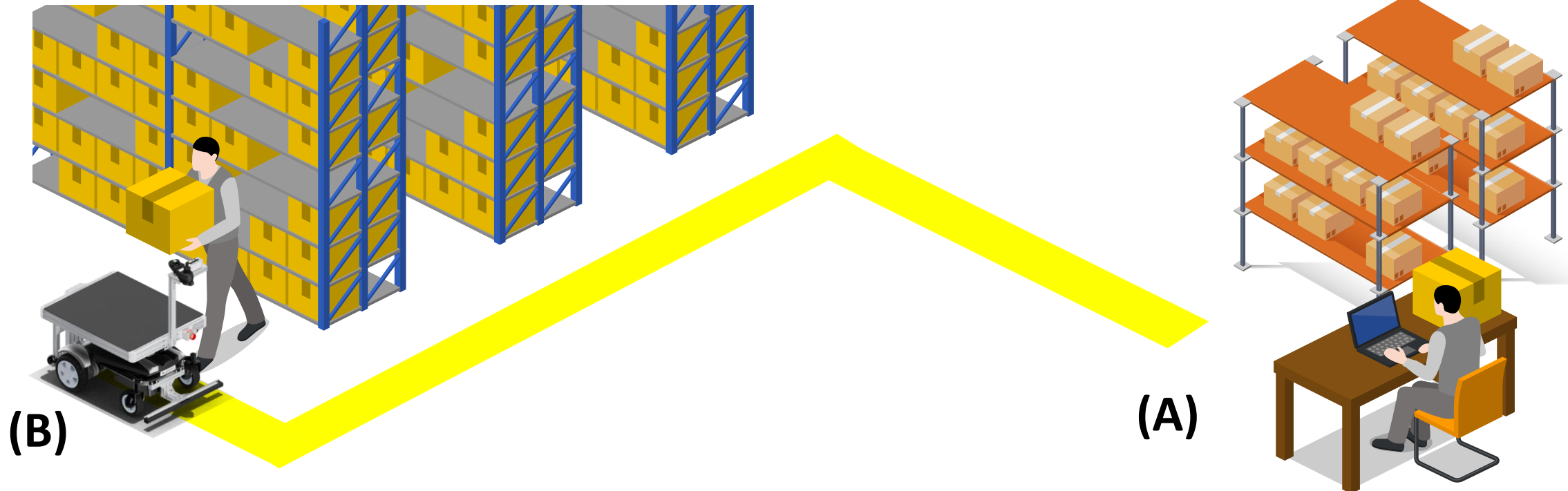
- Recommend for shorter distance route (less manpower, time and cost needed to set up tape on floor)
- Allows designated path for Thouser (Does not share path with other MHE)
- Suitable for dynamic environments (Line Trace navigation only focus on the quality of floor tape), outdoor
- Require positioning accuracy that does not depend on environment changes



Line Trace Navigation



It is suitable for following operating conditions

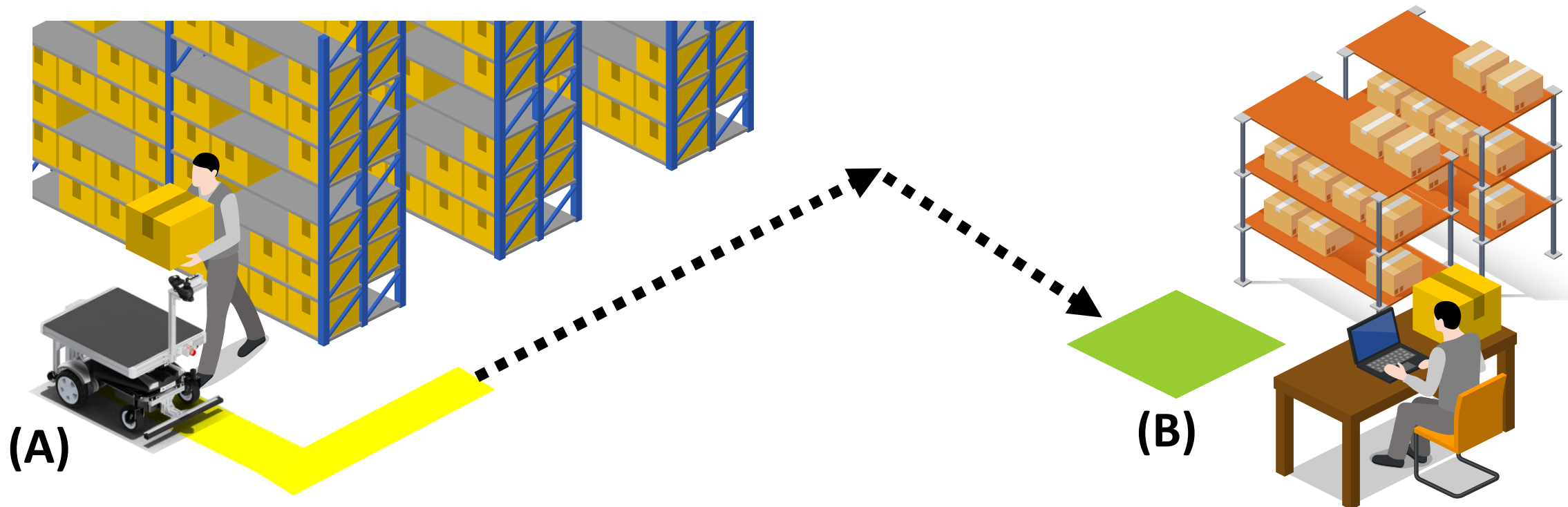
- Require management over multiple THOUZER operation (Highway function)
- Complicated routes with multiple destinations and branches



Line Trace <-> Memory Trace®

Combination of both navigation could complement each navigation drawbacks

- Line Start Memory Trace 
- Memory Trace Marker 



Questions

- 1) **What is special about DOOG navigation mode? (all 3 modes)**
- 2) **What navigation mode should I recommend to client if they want the fastest and easiest way to help their worker in picking task?**
- 3) **What navigation mode should I recommend to client if they don't want to have tape on their operation floor and easy to set up by themselves?**